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**Ore screening panel system**

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**(71) Applicant(s)**  
**Richardson Pacific Limited**

**(72) Inventor(s)**  
**Jeff Zubovich**

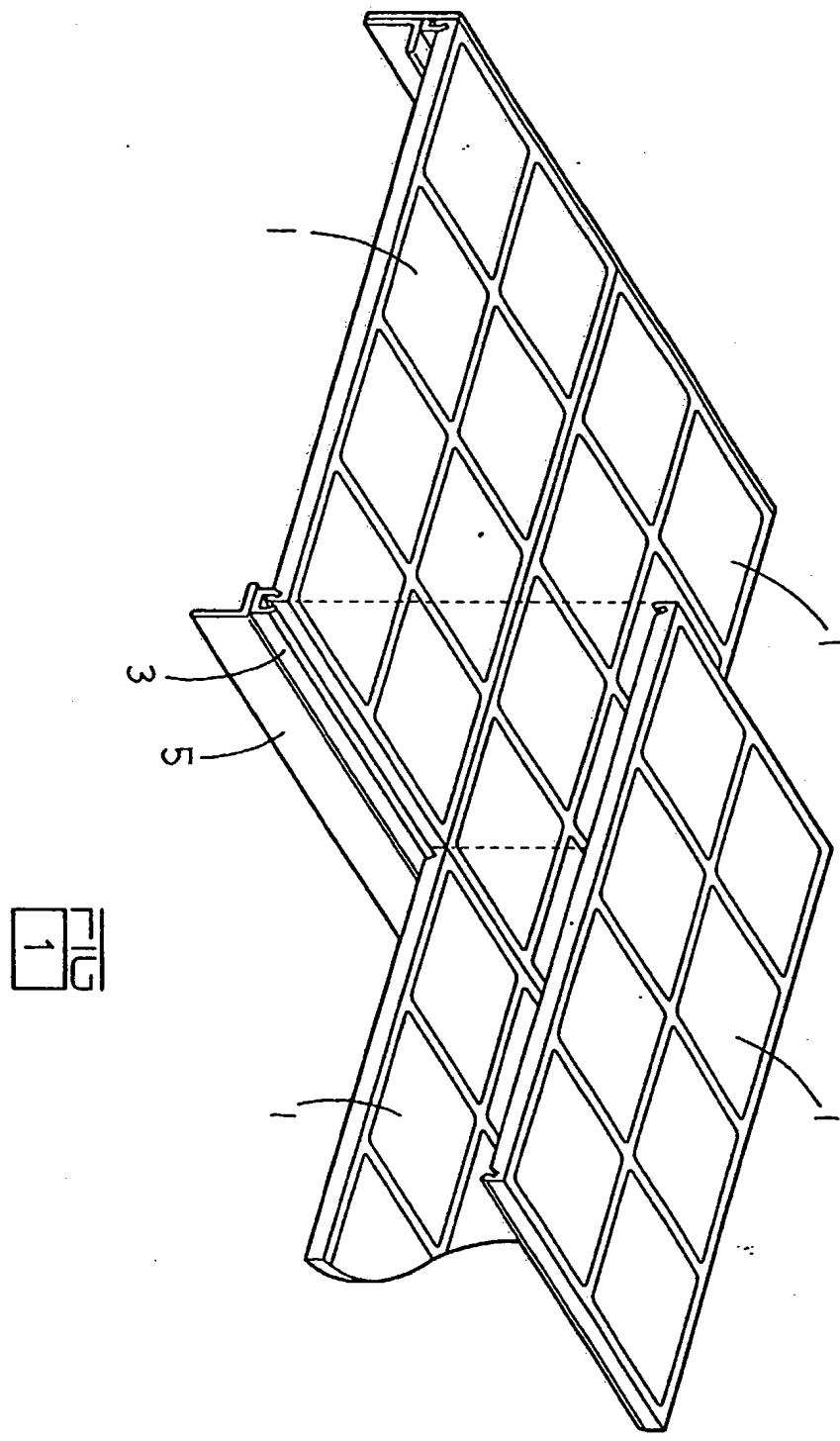
**(74) Agent/Attorney**  
**DARRYL B MISCHLEWSKI, 24 Christowel Street, CAMBERWELL VIC 3124**

**ABSTRACT**

A mining screening panel fastening system consisting of a support bar 13 with a securing channel 14 adapted to receive a skirt 16 of the screening panel 11.

5 The skirt is adapted to fit over the in-turned edge 15 of the channel 14 without the need of any force. The outwardly inclined face 18 at the thickened lower edge of skirt 16 engages an identical face on an abutting panel to deflect the end of the skirt 16 under the edge 15 of the channel 14 to retain the panel 11 on the support bar 13.

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**ORIGINAL**

**COMPLETE SPECIFICATION**

**STANDARD PATENT**

Application Number:

Lodgement Date: **14<sup>th</sup> February 2000**

Applicant : **Richardson Pacific Limited**

Invention Title: **Ore Screening Panel System**

The following statement is a full description of this invention, including the best method of performing it known to the applicant.

## Ore Screening Panel System

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This invention relates to improvements in ore screening panels used in the separation and grading of materials in the mining and quarrying industries.

### **Background to the invention**

Australian patent 482212 proposed a modular screening panel system for ore screening decks which is now widely used by the mining industry and replaced the earlier screening cloths, and large wire screening frames. The screening panels were all of the same size [eg. 300mm] and made of reinforced polyurethane. The panels are adapted to be secured to an underlying support frame using dependent spigots which are a force fit into corresponding apertures in the support frame.

10 Patent 517319 provided an alternative method of securing the panels to the frame using a pin expanded fastening concept.

The Australian patent 556953 disclosed the use of a hold down bar which abutted the edge flanges on the panels and had spigots passing through apertures in the edge flanges and into apertures in the underlying support frame.

15 Australian patent 559443 improved on this concept by providing a channelled bar which could be bolted to the underlying support frame. The panels had dependent flanges which were a force fit into the channel of the bar. A pair of abutting panels each provided flanges to fit into one channel. Together two abutting edge flanges provided a shape complementary to the cross sectional shape of the channel.

20 Patent 627919 discloses a modification of that arrangement but still relying on the force fit of the dependent flange or skirt on the edge of the panel, into the channel of the hold down bar.

It is an object of this invention to provide an alternative means of fastening screening panels which enables them to be easily installed and replaced.

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### **Brief description of the invention**

The present invention provides a mining screening assembly comprising

a) a plurality of parallel support bars each incorporating a longitudinal channel open at the top, the width of the opening to the channel being less than the internal width below the opening and

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b) screening panels adapted to be secured to the support bars, said panels having, on two parallel edges, dependent skirts adapted to extend into said longitudinal channels in the support bars, without the need to force the skirt over the edge of the channel opening, said skirts having on their outer face adjacent the lower edge a  
5 bead or thickening.

The arrangement has the advantage that no force is required to fit a panel onto its support bar unless an adjacent panel is already in place. Then the force acts against the skirt of the adjacent panel deflecting the lower portion of the skirt sideways to be accommodated by the greater width of the channel below the opening. The external  
10 beads or thickening on the lower edge of each skirt abut each other and create a combined width greater than the width of the channel opening and consequently provide resistance to the removal of the panel from the support bar. The narrowing of the opening of the channel may be achieved by turning the edges of the channel inwardly or by creating a recess in each channel wall below the opening. Preferably  
15 the width of the channel opening in each support bar is at least equal to the thickness of the two abutting dependent skirts.

The term channel is defined to include both a continuous and discontinuous channel. A discontinuous channel may consist of short sections adjacent the ends of each panel and further short sections adjacent the middle of the panel edges. The  
20 effective length of the channel need only be sufficient to ensure the panel is retained on the support bar.

The dependent skirts on the panel may extend below the base of the panel body or may be partly or wholly created by a recess formed between the body and the skirt along two parallel edges of the panel. The recess so formed needs to accommodate a portion of the upper edge of one wall of the channel. Preferably the  
25 recess is of a shape complementary to the external shape of the upper edge of the channel wall. Again the skirts and any associated recess need not extend continuously along the edge of the panel but need only be located to fit into the channel portions of the support bar.

30 **Detailed Description of the Invention**

The invention will now be described with reference to the drawings in which figure 1 is a perspective view of a set of screening panels mounted on support bars which in turn are mounted on a machine frame;

figures 2 A and 2B are section views of one embodiment of a support bar and thin section modular panels according to this invention;

Figures 3A and 3B are section views of a second embodiment of a support bar and thick section modular panels according to this invention;

5 figures 4 and 5 are side views of the support bars shown in figures 2A and 3A respectively.

As shown in figure 1 in the screening panels 1 are arranged in modular fashion to be mounted on the support bars 3 which in turn are bolted on to the machine frame members 5. This arrangement is conventional. This invention is particularly useful  
10 with modular rectangular panels in which the length of the panel is twice its width. These rectangular panels extend between the support bars, so that the attachment means for securing the panels to the support bars are on the short sides of the panel.

Figures 2A and 2B illustrate the invention in respect of a thin section screening  
15 panel 11 and illustrate the cross sectional configuration of the associated support bar 13. The screening panel 11 and the support bar 13 are both preferably composed of polyurethane. The support bar 13 is formed from a U-section and has an internal channel 14 partially closed by the in turned upper edge flanges 15. Along two parallel edges of the screening panel 11 the edge skirt 16 is arranged adjacent a  
20 groove 17. The groove 17 is shaped to accommodate the outer faces of the end flange 15 of the support bar 13. Skirt 16 has an enlarged lower edge created by the outwardly inclined face 18. In figure 2A the side of the two abutting faces 18 of the abutting panels 11 are now aligned with the plane of contact between the end faces  
25 of the two panels 11. The internal face 19 has deflected so that it contacts the inclined face of the edge flange 15 of support bar 13. The end face 20 of skirt 16 is also deflected into contact with the wall of channel 14 below the end flange 15.

Figure 4 shows a side view of bar 13 and the view along line A corresponds to the section view seen in figure 2A.

Figures 3A and 3B illustrate the invention in respect of a thick section screening  
30 panel 21 and illustrate the cross sectional configuration of the associated support bar 23. The screening panel 21 and the support bar 23 are both preferably composed of polyurethane. The support bar 23 forms an internal channel 24 partially closed by the in turned upper edge flanges 25. The support bar 23

incorporates in its base portion a reinforcing bar 23a composed of steel or a fibre reinforced plastic such as polyurethane or nylon. Along two parallel edges of the screening panel 11 the edge skirt 26 is formed by the adjacent recess 27. A reinforcing bar 22 of steel or fibre reinforced plastic is located in the panel, inwardly of and below the recess 27. Recess 27 is shaped to accommodate the outer faces of the end flange 25 of the support bar 23. Skirt 26 has an enlarged lower edge created by an outwardly inclined face 28. The side of the two abutting faces 28 of the abutting panels 21 are now aligned with the plane of contact between the end faces of the two panels 21. The internal face 29 has deflected so that it contacts the inclined face of the edge flange 25 of support bar 23. The end face 30 of skirt 26 is also deflected into contact with the wall of channel 24 below the end flange 25.

Figure 5 shows a side view of bar 23 and the view along line B corresponds to the section view seen in figure 3A. Bolt holes 31 accommodate the bolts which fasten the support bar 23 to the frame 5. Support bar 23 is also shown in figure 5 to have a discontinuous channel 24. The discontinuity in the channel 24 allows easier access to the bolt holes 31.

From the above it can be seen that this invention provides an alternative fastening system that allows easy placement of panels into the support bars. The fastening portions of the panels and the support bars are relatively simple shapes that are relatively simple to mould, unlike some of the fastening arrangements in the prior art.

**The claims defining the invention:**

1) A mining screening assembly comprising

a) a plurality of parallel support bars each incorporating a longitudinal channel open at the top, the width of the opening to the channel being less than the internal width below the opening and

b) screening panels adapted to be secured to the support bars, said panels having on two parallel edges dependent skirts adapted to extend into said longitudinal channels in the support bars, without the need to force the skirt over the edge of the channel opening, said skirts having on their outer face adjacent the lower edge a bead or thickening.

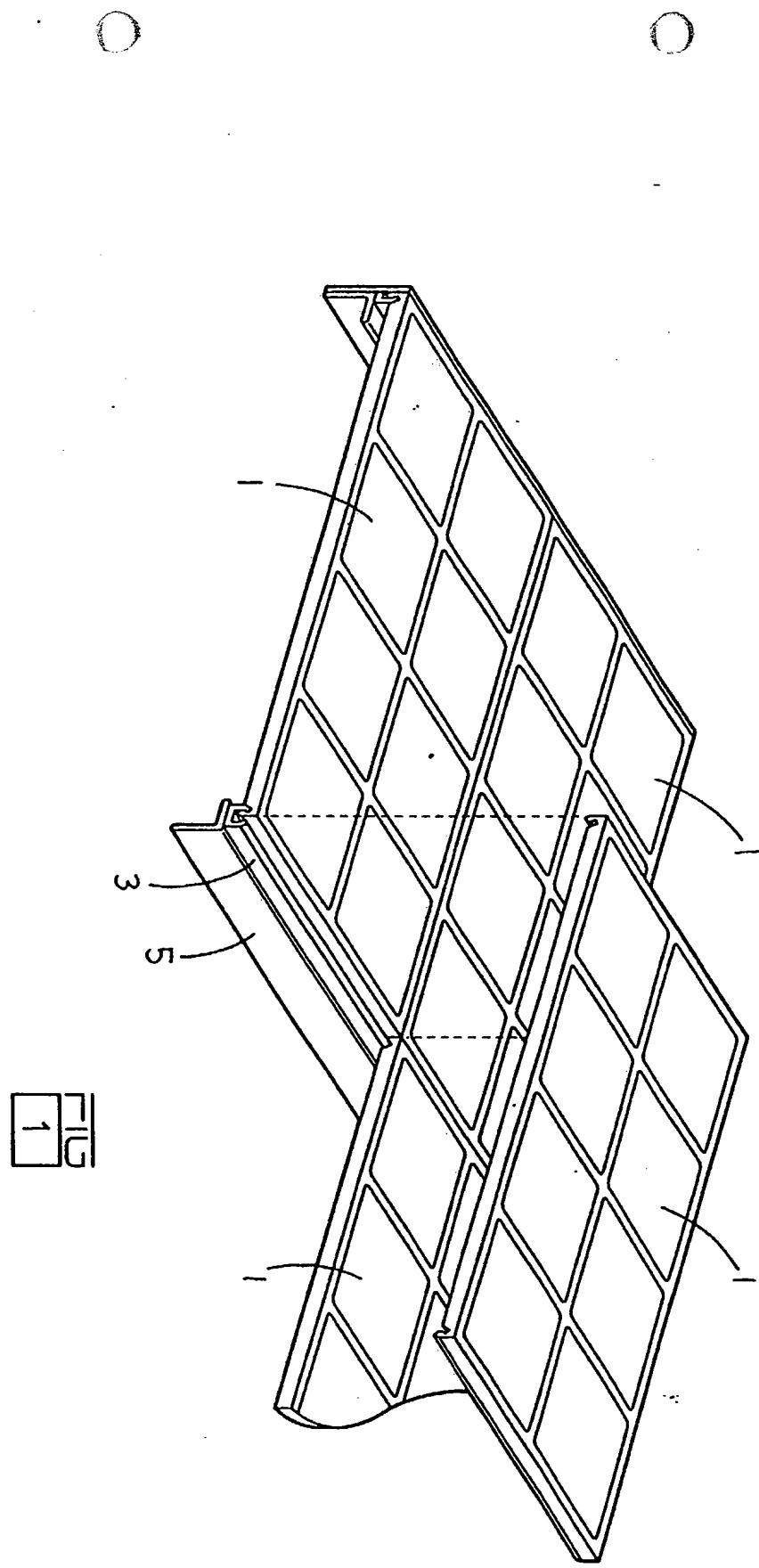
2) A mining screening assembly as claimed in claim 1 wherein the panels have a groove or recess associated with said skirt, said recess being shaped to receive the upper edge of a wall of the channel in said support bar.

3) A mining screening assembly as claimed in claim 2 wherein the support bars are channel shaped members wherein the channel is defined by two wall sections.

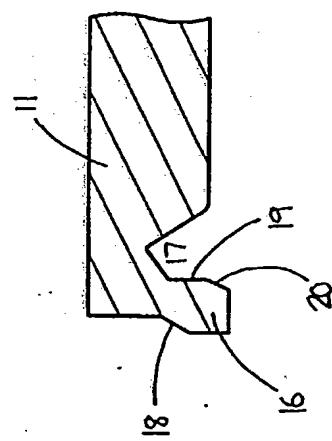
20 4) A mining screening panel adapted to be used in the assembly as claimed in claim 1, said panels having on two parallel edges dependent skirts adapted to extend into said longitudinal channels in the support bars, without the need to force the skirt over the edge of the channel opening, said skirts having on their outer face adjacent the lower edge a bead or thickening.

25 5) A mining screening panel as claimed in claim 4 for use in the assembly as claimed in claim 3 wherein the lower edge of the skirt is aligned with the lower surface of the screening panel.

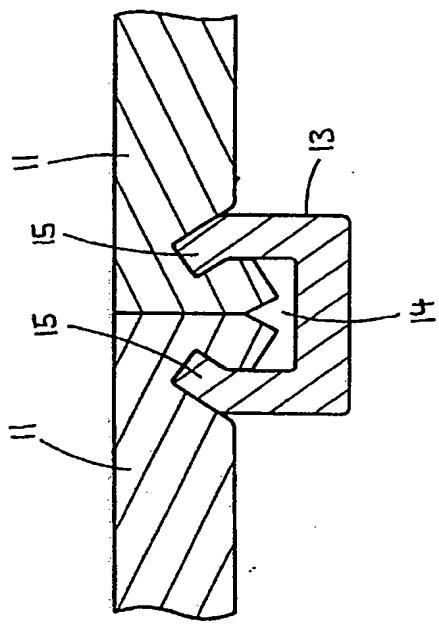
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2B



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2A

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FIG  
3A

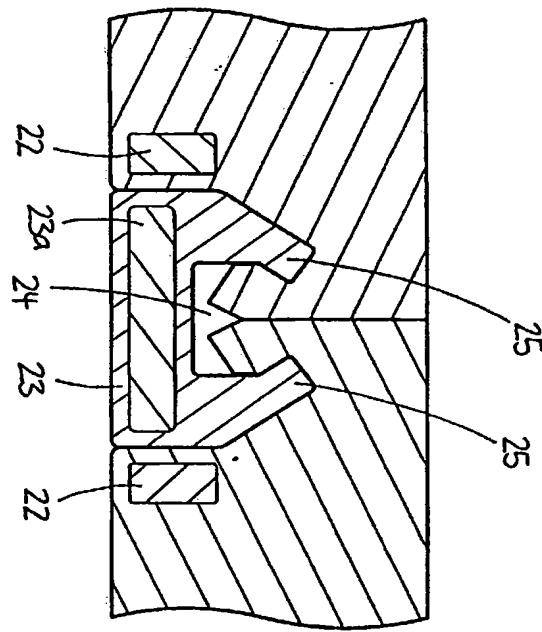
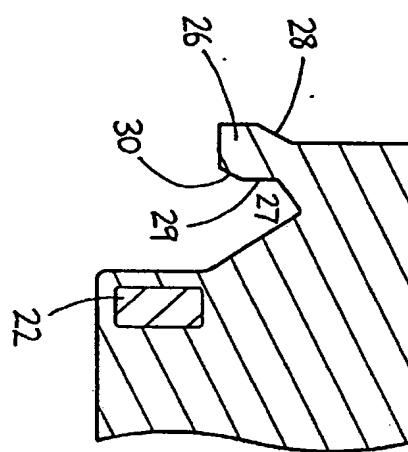
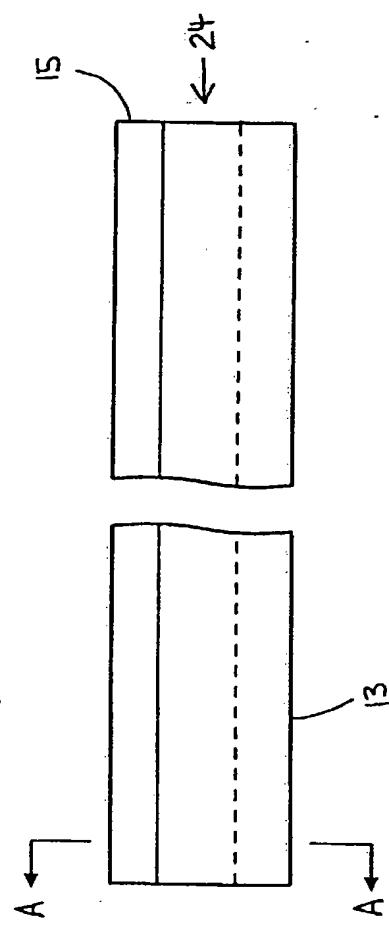


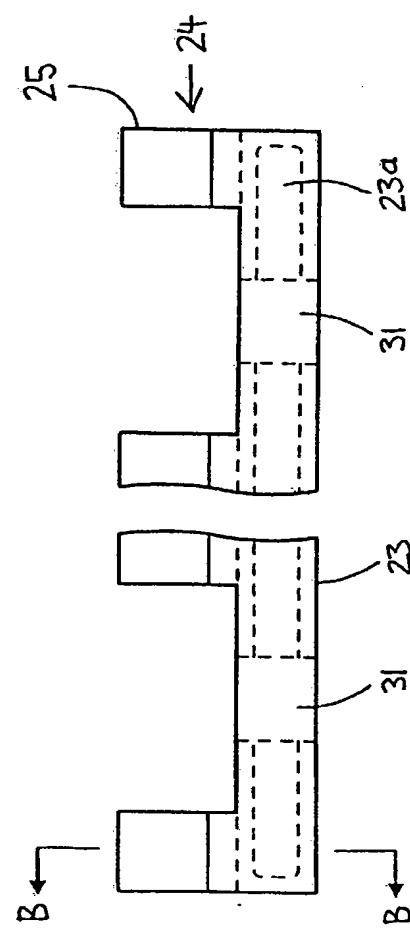
FIG  
3B



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